

### **P57: Environmental epigenetics and *Daphnia* as a model organism**

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**Introduction:** *Daphnia*'s cyclic parthenogenesis life cycle is controlled by environmental cues and determines the population genetic variability. The asexual reproduction maintains the genetic background. This, allied to the fact that epigenetic changes were already described in *Daphnia* turns it in a useful model to study the effect of epigenetic changes in the organism.

**Objectives:** The purpose of this work is to systematically review the literature on the advantages and constraints of using *Daphnia* species response, to study the epigenetic effects of environmental stressors.

**Results and Discussion:** Several characteristics of *Daphnia* can be epigenetic regulated (helmet and neckteeth formation, growth, fertility, sex). Helmet and neckteeth formation are induced defenses triggered by chemicals, even in neonates not exposed. Reproduction and growth was shown to decrease when *Daphnia* were exposed to several chemicals, as well as in progeny not exposed. Several chemicals have a known effect on DNA methylation and gene transcription. Some decrease the DNA methylation rate, propagating this effect to the next two generations and even increasing the effect in successive generation's exposures. In other cases an acclimation response was observed. Some authors are also trying to detect the genes that are differentially transcribed after toxic exposure in order to know what possible biological mechanism may be altered. However transgenerational epigenetic effect must be interpreted very carefully, since the transference of epigenetic modifications between generations can only be proven if these modifications are still present in the F3 generations.

**Conclusion:** Epigenetic changes in *Daphnia* are only beginning to be studied. It was proven that alteration of epigenetic status of *Daphnia* is possible after the exposure to several chemicals.

#### **References**

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